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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,026	08/29/2006	Naoki Kanie	129234	6639

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EXAMINER	
CHUANG, ALEXANDER	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,026	KANIE, NAOKI	
	Examiner	Art Unit	
	Alexander Chuang	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FUEL CELL SYSTEM AND METHOD OF CONTROLLING THE SYSTEM

1. Applicant's request for reconsideration was received on November 7th 2008. No claims are amended.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. Claims 1 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Ueda et al (US 2004/0013919 A1).

The means for detecting an operation abnormality of said discharge means is disclosed in the specification in **paragraph 31** and is interpreted to be the control unit, which is a well-known computer system such as ECU (electric control unit) as stated in paragraph 28.

The means for changing the supplied quantity of said oxidizing gas when an abnormality is detected is disclosed in **paragraph 25** and is interpreted to be the compressor.

As to claim 1 and 10, Ueda et al discloses a fuel cell system, which a fuel gas from a fuel cell is discharged from a purge valve (figure 1, 6) to a dilution device (figure 1, 10) which dilutes the hydrogen with oxidant gas and discharges the gaseous mixture, comprising:

- An ECU (figure 1, 40) runs a control routine for hydrogen purging (paragraph 48). This routine includes detecting an operation abnormality (figure 2, S103).
- A compressor (figure 1, 2) which controls the air pressure.

The reference discloses when hydrogen concentration at the outlet exceeds a predetermined value, the purge operation is restrained and the power generation operation is also restrained (Figure 2, paragraph 54-58). When the power generation is restrained, the amount of reactants (hydrogen and air) is reduced (paragraph 58); thus, the supply air quantity is changed.

As to claim 2, the control routine for hydrogen purging comprises of checking the hydrogen concentration at outlet of the fuel cell (figure 2, S103).

As to claim 3, when abnormality is detected, the air supplied to the system is increased in order to dilute the excess hydrogen (paragraph 8).

As to claim 4, Ueda et al disclosed a dilution device (figure 1, 10) where the concentration of hydrogen is decreased to a predetermined level (4% by volume), which can be discharged through a discharge pipe (figure 1, 36) (paragraph 44). With such a low hydrogen concentration, it is unlikely an abnormal reaction would take occur.

As to claim 5 and 6, it is noted that pressure differences drive gases in a certain direction. Thus, as the hydrogen exits through the purge valve of Ueda et al, the pressure builds up in the dilution device. When the pressure of the dilution device exceeds the other side of the purge valve due to hydrogen and oxidant gas, a back pressure is induced and will continue to increase as more oxidizing gas is introduced into the dilution device.

As to claim 7, Ueda et al disclosed a purge valve (figure 1, 6) as the discharge means.

Claim Rejections - 35 USC § 103

4. Claim 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al (US 2004/0013919) in view of Ueda (US 6,864,003 B2) hereafter '003 reference and Yamamoto et al (US 2003/0077488 A1).

The means for determining the required output quantity of said fuel cell operation abnormality of said discharge means is disclosed in the specification in **paragraph 31** and is interpreted to be the control unit, which is a well-known computer system such as ECU (electric control unit) as stated in paragraph 28.

The means for supplying the oxidizing gas to said fuel cell in a supply quantity corresponding to said required output quantity is disclosed in **paragraph 25** and is interpreted to be the compressor.

The means for detecting an operation abnormality of said purge valve disclosed in the specification in **paragraph 31** and is interpreted to be the control unit, which is a well-known computer system such as ECU (electric control unit) as stated in **paragraph 28**.

The means for increasing the supplied quantity of said oxidizing gas when an abnormality of said purge valve is detected is disclosed in **paragraph 25** and is interpreted to be the compressor.

As to claim 8, Ueda et al disclose:

- A purge valve (figure 1, 6) which purges fuel gas from a fuel cell.
- A dilution device (figure 1, 10) which dilutes the hydrogen with oxidant gas and discharges the gaseous mixture.

- An ECU (figure 1, 40) runs a control routine for hydrogen purging (paragraph 48). This routine includes detecting an operation abnormality (figure 2, S103).
- A compressor (figure 1, 2) which controls the air pressure.

Ueda et al '003 discloses a suppliable output calculation unit (figure 3, 94), which is part of the fuel cell control unit (figure 3, 100). This unit transmits a signal to the reaction gas supply devices (figure 3, 26 and 28) to supply reactants into the fuel cell (9: 40-45). It would have been obvious to one of ordinary skill in the art to use a output calculation unit in the fuel cell of Ueda et al, because Ueda et al '003 teaches using such a device to calculate the required output and required reactants to attain the output requirement from the fuel cell.

Ueda et al does not explicitly disclose changing the supplied quantity of oxidizing gas when an abnormality of the purge valve is detected (where abnormality is the increased hydrogen concentration at the exit of the fuel cell); however, Yamamoto et al disclose the hydrogen gas is diluted with air to decrease the concentration of hydrogen to less than a concentration limit (in this case 4%) (paragraph 80), which is below the combustible concentration limit (paragraph 30). Yamamoto et al also states if the amount of air is insufficient, the bypass valve allows more air into the diluter (44) (paragraph 80). Therefore, it would have been obvious to one of ordinary skill in the art to increase the amount of air to the diluter of Ueda et al when the hydrogen is above a concentration limit, because Yamamoto et al teaches a bypass valve allows more air into the diluter when the hydrogen concentration is over a limit to reduce the concentration of hydrogen below the combustible concentration limit to prevent the danger of combustion.

As to claim 9, Ueda et al does not explicitly teach determining an auxiliary unit power quantity and adding the two load requirements together. Ueda et al '03 discloses a suppliable

output calculation unit (figure 3, 94), which is part of the fuel cell control unit (figure 3, 100). This unit transmits a signal to the reaction gas supply devices (figure 3, 26 and 28) to supply reactants into the fuel cell (9: 40-45). As known in the art, a controller, such as an ECU, is capable of adding the two power quantities together to obtain the total output power quantity. Thus, it would have been obvious to one of ordinary skill to couple the controller and the oxidant flow path to control the flow of oxidant in Ueda et al, because Ueda et al '003 teach the use of a controller to calculate the required output quantity of the fuel cell and the amount of reactants necessary to attain the output quantity.

Response to Arguments

5. Applicant's arguments with respect to claims 8-9 have been considered but are moot in view of the new ground(s) of rejection.

6. Applicant's arguments regarding claims 1-7 and 10 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

(a). Ueda I (2004/0013919) "does not disclose or suggest to change the supplied quantity of the oxidizing gas for dilution when an abnormality of the discharge means is detected."

(b). Inventions recited in claims 1 and 10 have advantages not recognized in the prior art.

In response, please consider the following:

(a). The reference discloses when hydrogen concentration at the outlet exceeds a predetermined value, the purge operation is restrained and the power generation operation is also

restrained (Figure 2, paragraph 54-58). When the power generation is restrained, the amount of reactants (hydrogen and air) is reduced (paragraph 58); thus, the supply air quantity is changed.

(b). Secondary considerations are irrelevant to 35 U.S.C. 102 rejections. See MPEP 2131.04.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Chuang whose telephone number is (571)270-5122. The examiner can normally be reached on Monday to Thursday 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

Alexander Chuang
Patent Examiner GAU 1795
February 17th 2009

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795